DOCUMENT RESUME

ED 083 476 CE 000 535

AUTHOR	Guinn, Nancy
TITLE	Factors Related to Adaptability to Military Service Among 1965 Airman Accessions.
INSTITUTION	Air Force Human Resources Lab., Lackland AFB, Tex. Personnel Research Div.
SPONS AGENCY	Air Force Human Resources Lab., Brooks AFB, Texas.
REPORT NO	AFHRL-TR-73-42
PUB DATE	Sep 73
NOTE	21p.
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	Academic Achievement; Age; Behavior Patterns; Career Choice; Dropouts; *Failure Factors; *Military Personnel; Military Training; Objectives; *Screening Tests; *Selection; *Success Factors; Test Results

ABSTRACT

Distributions were accomplished to demonstrate the relationships between age, educational level, and Armed Forces Qualification Test scores of the 1965 airman accessions and their reenlistment desirability at the completion of their initial tour. The largest percentage of undesirable enlistees was found in the high school non-graduate, Category 4, and seventeen year old groups. Using these three categories of variables, it was found that it would be possible to eliminate 34 percent of the undesirables, although 76 percent of the individuals falling in this three category group actually proved to be successful in their military careers. It was emphasized that caution should be used in attempting to establish a screening procedure to identify undesirable enlistees since a significant number of potentially qualified personnel might be excluded at the same time. (Information tables are included.) (Author/KP)

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

ED 083476

NOV 30 1973

AFHRL-TR-73-42

AIR FORCE HUMAN RESOURCES LABORATORY

FACTORS RELATED TO ADAPTABILITY TO MILITARY SERVICE AMONG 1965 AIRMAN ACCESSIONS

By

Nancy Guinn

PERSONNEL RESEARCH DIVISION
Lackland Air Force Base, Texas 78236

January 1972
(Published as TR in September 1973)

Approved for public release; distribution unlimited

AIR FORCE SYSTEMS COMMAND
BROOKS AIR FORCE BASE, TEXAS 78235

CE 000 535

FILMED FROM BEST AVAILABLE COPY

NOTICE

When US Government drawings, specifications, or other data are used for any purpose other than a definitely related Government procurement operation, the Government thereby incurs no responsibility nor any obligation whatsoever, and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise, as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

This report was submitted by the Personnel Research Dvision, Air Force Human Resources Laboratory, Lackland Air Force Base, Texas 78236, under Project 77190205, with the Hq, Air Force Human Resources Laboratory (AFSC), Brooks Air Force Base, Texas 78235. Dr. Nancy Guinn, Personnel Research Division, was the task scientist.

This report has been reviewed and cleared for open publication and/or public release by the appropriate Office of Information (OI) in accordance with AFR 190-17 and DoDD 5230.9. There is no objection to unlimited distribution of this report to the public at large, or by DDC to the National Technical Information Service (NTIS).

This technical report was reviewed and is approved.

Leland D. Brokaw, Chief
Personnel Research Division

Approved for publication.

Harold E. Fischer, Colonel, USAF
Commander

Factors Related to Adaptability to Military Service Among 1965 Airman Accessions

By

Nancy Guinn
Personnel Research Division
Air Force Human Resources Laboratory

I. INTRODUCTION

Many basic airmen meet established enlistment standards but are discharged for unsuitability or classified as ineligible to reenlist upon expiration of their first term of enlistment. One of the major objectives of the selection and classification program is to develop more precise procedures or methods which will identify those young men not likely to succeed in their military career. The reasoning behind this goal is simple. It is a costly process to select and train an individual for military service only to find that at some later date he is unsuitable or unable to adapt to the military environment. Although discharge for unsuitability can occur at any time in service, the prediction of unsuitable performance during the initial tour of enlistment is usually considered of paramount concern.

The problem of unsuitability appears to be a universal one among all branches of the armed services. During the past 15 years, various attempts have been made to develop a screening technique which could be used to reduce the number of individuals who would be eliminated for unsuitability at a later date (Flyer, 1959; Klieger, Dubuisson & deJung, 1961; Plag &

Goffman, 1966). Although some variability exists between the various services in the importance of pre-enlistment characteristics, there is a general concensus that level of education, age, and general intelligence level are highly predictive of military adjustment (Flyer, 1959; Fisher, Ward & Holdrege, 1960; Gordon & Bottenberg, 1962; Arthur, 1971; Plag and Goffman, 1967). In the Air Force setting, further research by Flyer (1963; 1964) identified educational reference data and behavioral evaluations during basic military training as improving prediction of airman performance within the framework of operational selection and classification procedures used at that time. Findings also reflected that an increase in prediction was obtained when composite scores were computed for the different occupational groups as compared with the use of a population derived score for all career fields. In Naval research, other factors such as arrest history, number of school expulsions, family stability, birthplace, race, and aptitude scores were found to predict effective Naval performance (Plag & Goffman, 1966).

Special emphasis on the assessment of adaptability was initiated by the Air Force in the early 1960's. When the Human Reliability program was initiated in 1966, research findings of the Personnel Laboratory[1] in this area were incorporated into an operational system of personnel selection for high risk and/or sensitive assignments. The initial screening process developed

[1]Unpublished working paper on unsuitable airmen: Research investigations by the Personnel Laboratory during 1961; Flyer, Eli S., Adaptability and Quality Evaluations Branch, April 1961.

for this program included a combination of aptitudinal, attitudinal, and demographic information. Peer ratings and tactical instructor evaluations were combined with pre-service data bearing on the adjustment and attainment of the individual prior to his entry into military service. The comprehensive assessment procedure currently in operational use includes an extensive evaluation of personal data such as legal, background, and military data; family, work and medical history; and personal references. In addition, confidential inquiry forms sent to personal, credit, medical, educational, and employment references as well as the police department are reviewed in evaluating the stability and suitability of each candidate for a highly-sensitive position. The validity of this comprehensive assessment procedure has been apparent by the reduction in overall attrition rates in technical training. [2]

In each branch of the armed services, the problem of adaptability appears more prevalent among airmen of lower mental ability (Gordon & Flyer, 1962; Plag, Goffman & Phelan, 1957; Plag, Goffman & Phelan, 1970; Helme & Anderson, 1964). Air Force research in this area has indicated that the failure rate for this group is much higher, and within this lower aptitude category, it is possible to identify small subgroups with lower failure rates based on predictions from aptitude and pre-service educational data (Gordon & Flyer, 1962). Research by Naval personnel indicate similar pre-enlistment characteristics

[2]Operational statistics from the Assessments Branch for 3rd quarter, FY 71.

are valid for predicting four-year Naval effectiveness among Category IV personnel: educational achievement, number of school explusions, AFQT score, and number of arrests (Plag, Wilkins & Phelan, 1968; Plag et al., 1967). With the new mental standards Marine Corps accessions, years of schooling completed, average AQE scores, parents' marital status, age at enlistment, race, and average aptitude test scores combined into composites were found to have predictive validities in the .21-.25 range. Using these predictor composites as a basis, acturial tables and tables of odds for effectiveness scores were constructed for possible use by recruiters as a basis for selection of Naval and Marine Corps personnel (Plag et al., 1970). Although all of these studies designed to predict the adjustment of Category IV or low aptitude personnel indicate that these individuals are somewhat inferior to their contemporaries in other mental ability categories on measures of military adaptation and performance, a majority of these individuals were found to be effective performers (Plag et al., 1968; Grunzke, Guinn, & Stauffer, 1970).

Another aspect of adaptability emphasized in several research projects centers on the emotional stability of enlistees when subjected to military life and the interrelation of psychiatric illness and military effectiveness. Studies in this area have revealed that the incidence of mental disorders in the Navy varies with sex, age, length of service, rank, occupational specialty, and rate of promotion (Arthur & Gunderson, 1965; Gunderson & Arther, 1966). In another study by Plag, Arthur and Goffman (1970), it was found that

psychiatric patients do possess characteristics of pre-service adaptation quite similar to enlistees exhibiting non-effective performance. These psychiatric patients differed from control enlistees on such characteristics as level of schooling, AFQT score, family stability, number of expulsions from school, and reason for enlistment. Such a finding suggests that a selection system which differentiates between effective and non-effective military performance would also eliminate the number of enlistees with a high potential of becoming psychiatric patients.

Current Air Force research on the future volunteer force suggests that the quantity and quality of potential volunteers may be somewhat lower than the number and aptitude level of current accessions (Valentine & Vitola, 1970; Vitola & Valentine, 1971). If such a decrease is actually realized in the zero-draft environment, it becomes even more important to identify individuals who will most likely succeed in their military career. As a preliminary step in this area, this report presents the results of initial analyses on the use of pre-enlistment characteristics in screening for adaptability.

II. METHOD

Sample. The sample consists of 103,060 enlistees who entered the Air Force during 1965. Those entering an officer commissioning program and those whose desirability/suitability for military service could not be readily ascertained from historical records were eliminated from the sample. Those enlistees eliminated from analysis totaled 7,645 reducing the total N of the 1965 sample to 95,415.

Variables of interest. Three variables found to be valid predictors of adaptability/suitability in previous research were used: age at enlistment, pre-service educational achievement, and AFQT score.

Criterion variable. The criterion was dichotomous. Those classified as desirable or successful airmen were those who reenlisted or were eligible to reenlist at the completion of their first term. Undesirable or unsuccessful airmen were those discharged for reasons of unsuitability or were not eligible for reenlistment at the completion of their initial tour.

Procedure. Various percentage distributions were used to illustrate the relationship between the predictor variables and successful military performance and the usefulness of these variables in providing a basis for selection screening.

III. RESULTS AND DISCUSSION

Table 1 reflects the proportions of the 1965 accessions who can be considered desirable/successful by educational level attained prior to service. The high school non-graduate category has the largest percentage of undesirable enlistees. Eliminating all individuals without a high school diploma would eliminate approximately 22 percent of the total number of undesirables. However, along with the 2,887 undesirables, 7,529 high school non-graduates who were considered desirable would also have been eliminated. If high school graduation were to be used as a screening device, 11 percent of the total accessions would have been rejected for military service and 72 percent of those rejected would have been successful.

TABLE 1

DESIRABILITY BY EDUCATIONAL LEVEL

Educational Level		Desirability Status: Desirable	% of Grand Total	Undesirable	% of Grand Total	Total	% of Grand Total
High school non-graduate	N	7,529	7.9	2,887	3.0	10,416	10.9
	%	72		28		100	
High school graduate	N	61,575	64.5	8,946	9.4	70,521	73.9
	%	87		13		100	
College work, no degree	N	12,390	12.9	1,368	1.4	13,758	14.4
	%	90		10		100	
College degree plus	N	650	.7	70	.2	720	.8
	%	90		10		100	
TOTAL	N	82,144		13,271		95,415	
	%	86		14		100	

AFQT category has been found to be a valid predictor of military success in previous research. In the 1965 airman population, differences are found in the rate of undesirable airmen by category. Table 2 indicates that 18 percent of the low mental ability airmen are identified as undesirable. If it were feasible and/or practical to restrict enlistments to Categories I, II, and III personnel, only 11 percent of the identified undesirables would be eliminated. Even more detrimental is the fact that 82 percent of those Category IV enlistees who would be excluded would have been successful in their military career. It should be noted that in the 1965 sample, only eight percent of the total accessions were Category IV personnel. With the implementation of Project 100,000, Category IV input was increased to approximately 18 percent. Although the desirability of the current Category IV accessions may be quite similar to the 1965 Category IV personnel, the total number in this category is larger today than indicated in the 1965 group, and the risk of eliminating an even larger proportion of potentially successful enlistees is present.

TABLE 2

DESIRABILITY BY AFQT CATEGORY

AFQT Category		Desirability Status: Desirable	% of Grand Total	Undesirable	% of Grand Total	Total	% of Grand Total
I (AFQT score 93-up)	N	6,310	6.6	668	.7	6,978	7.3
	%	90		10		100	
II (AFQT score 65-92)	N	32,945	34.5	4,116	4.4	37,061	38.8
	%	89		11		100	
III (AFQT score 31-64)	N	36,430	38.2	7,054	7.4	43,484	45.6
	%	84		16		100	
IV (AFQT score 10-30)	N	6,459	6.7	1,433	1.5	7,892	8.3
	%	82		18		100	
TOTAL	N	82,144		13,271		95,415	
	%	86		14		100	

In Table 3, the frequency and percentage of desirable/undesirable personnel are given for each age group. Previously, it has been found that the younger airman may be the one to encounter difficulty in adjusting to military life. Similar results are found in the 1965 group. The largest percentage of undesirables appears in the 17-year-old group. Eliminating this relatively small group only reduces the undesirable group by 1.5 percent, and along with each undesirable, approximately three desirable 17 year olds would also be rejected.

TABLE 3

DESIRABILITY BY AGE GROUP

Age		Desirability Status: Desirable	% of Grand Total	Undesirable	% of Grand Total	Total	% of Grand Total
17	N	657	.7	188	.2	845	.9
	%	78		22		100	
18	N	18,703	19.5	4,103	4.3	22,806	23.9
	%	82		12		100	
19	N	23,849	25.0	3,707	3.9	27,556	28.9
	%	87		13		100	
20	N	22,866	24.0	2,761	2.9	25,627	26.8
	%	89		11		100	
21 plus	N	16,069	16.8	2,512	2.7	18,581	19.5
	%	86		14		100	
TOTAL	N	82,144		13,271		95,415	
	%	86		14		100	

Since age, AFQT category, and educational level appear to be related to success in the military, an effort was made to determine the combined effectiveness of using all three of these variables as a basis for a screening procedure. All enlistees who fell in one or more of the following categories were identified: AFQT Category IV, 17 years old, and/or high school non-graduate. Results of this approach are presented by Table 4. Eliminating all Category IV, high school non-graduate, and 17 year old enlistees reduces the number of undesirables by 34 percent. However, all enlistees having one or more of these three characteristics represents one-fifth of the total accessions, and 76 percent of those individuals proved to be successful airmen. Such a restrictive screening procedure would not be economically or practically feasible in an operational system today.

TABLE 4

DESIRABILITY BY COMBINED CHARACTERISTICS

Group		Desirability Status: Desirable	% of Grand Total	Undesirable	% of Grand Total	Total	% of Grand Total
Category IV, High School Non-graduates, & 17 year olds	N	14,474	15.1	4,453	4.7	18,927	19.8
	%	76		24		100	
All others	N	67,670	70.9	8,818	9.3	76,488	80.2
	%	88		12		100	
TOTAL	N	82,144		13,271		95,415	
	%	86		14		100	

IV. CONCLUDING REMARKS

These data are presented to emphasize the problems associated with the development and design of an effective screening procedure which will identify a maximum number of enlistees who might not adapt to the rigors of military service while not excluding a sizeable proportion of individuals who can, and will, make good servicemen. It is obvious that the use of biographical and aptitudinal data alone will not produce an effective screening device. One of the primary objectives in selection and assignment research is to improve our selection techniques now in operational use by refining and periodically reassessing the validity of current screening procedures. However, with the move toward a zero-draft environment, our emphasis must focus on broadening rather than restricting our manpower resource base. This would indicate that other procedures such as depth interviews, reference checks, and psychiatric diagnostic tools might be carefully explored in combination with background data to design a screening procedure which will identify, over and above the screening procedures now in operational use, a practical and significant number of undesirable enlistees to the minimum exclusion of potentially qualified personnel.

REFERENCES

Arthur, R. J. & Gunderson, E. K. E. Promotion and mental illness in the Navy. Journal of Occupational Medicine, 1965, 7, 452-456.

Arthur, R. J. Success is predictable. Military Medicine, 1971, 136, 539-545.

Fisher, W. E., Ward, J. H., Jr., Holdrege, F. E., & Lawrence, H. G. Prediction of unsuitability discharges. WADD-TN-60-260. Lackland AFB, Tex: Personnel Laboratory, Wright Air Development Center, October 1960. (AD-248 077)

Flyer, Eli S. Factors relating to discharge for unsuitability among 1956 airman accessions to the Air Force. WADC-TN-59-201. Lackland AFB, Tex: Personnel Laboratory, Wright Air Development Center, December 1959. (AD-230 758)

Flyer, Eli S. Prediction of unsuitability among first-term airmen from aptitude indexes, high school reference data, and basic training evaluations. PRL-TDR-63-17. Lackland AFB, Tex: 6570th Personnel Research Laboratory, Aerospace Medical Division, June 1963. (AD-420 530)

Flyer, Eli S. Prediction by career field of first term airman performance from selection and basic training variables. PRL-TDR-64-5. Lackland AFB, Tex: 6570th Personnel Research Laboratory, Aerospace Medical Division, March 1964. (AD-600 781)

Gordon, M. A. & Bottenberg, R. A. Prediction of unfavorable discharge by separate educational levels. PRL-TRD-62-5. Lackland AFB, Tex: 6570th Personnel Research Laboratory, Aerospace Medical Division, April 1962. (AD-284 802)

Gordon, M. A. & Flyer, Eli S. Predicted success of low-aptitude airmen. PRL-TDR-62-14. Lackland AFB, Tex: 6570th Personnel Research Laboratory, Aerospace Medical Division, August 1962. (AD-290 545)

Grunzke, M. E., Guinn, N., & Stauffer, G. F. Comparative performance of low ability airmen. AFHRL-TR-70-4. Lackland AFB, Tex: Personnel Research Division, January 1970. (AD-705 575)

Gunderson, E. K. E. & Arthur, R J. Demographic factors in the incidence of mental illness. Military Medicine, 1966, 131, 429-433.

Helme, W. H. & Anderson, A. A. Job performance of E. M. scoring low on AFQT. RESEARCH NOTE 146. Washington, D.C.: U.S. Army Personnel Research Office, 1964.

Klieger, W. A., Dubuisson, A. U., & deJung, J. E. Prediction of unacceptable performance in the Army. TECHNICAL RESEARCH NOTE 113. Human Factors Research Branch, TAG Research and Development Command, June 1961.

Plag, J. A. & Hardacre, L. E. The validity of age, education, and GCT score as predictors of two-year attrition among Naval enlistees. REPORT NUMBER 64-15. San Diego, California: U.S. Navy Medical Neuropsychiatric Research Unit, June 1964.

Plag, J. A. & Hardacre, L. W. Age, years of schooling, and intelligence as predictors of military effectiveness for Naval enlistees. REPORT NUMBER 65-19. San Diego, Calif: U.S. Navy Medical Neuropsychiatric Research Unit, July 1965.

Plag, J. A. & Goffman, J. M. The prediction of four-year military effectiveness from characteristics of Naval recruits. Military Medicine, 1966, 131, 729-735.

Plag, J. A., Wilkins, W. L., & Phelan, J. D. Strategies for predicting adjustment of AFQT Category IV Navy and Marine Corp personnel. REPORT NUMBER 68-28. San Diego, Calif: U.S. Navy Medical Neuropsychiatric Research Unit, October 1968.

Plag, J. A., Goffman, J. M., & Phelan, J. D. The adaptation of Naval enlistees scoring in mental group IV on the Armed Forces Qualification Test. REPORT NUMBER 68-23. San Diego, Calif: Navy Medical Neuropsychiatric Research Unit, September 1967.

Plag, J. A., Goffman, J. M., & Phelan, J. D. Predicting the effectiveness of new mental standards enlistees in the U.S. Marine Corps. REPORT NUMBER 71-42. Navy Medical Neuropsychiatric Research Unit, December 1970.

Plag, J. A., Arthur, R. J., & Goffman, J. M. Dimensions of psychiatric illness among first-term enlistees in the United States Navy. Military Medicine, 1970, 135, 665-673.

Valentine, L. D., Jr., & Vitola, B. M. Comparison of Self-motivated Air Force enlistees with draft-motivated enlistees. AFHRL-TR-70-26, AD-713-608. Lackland AFB, Tex: Personnel Research Division, Air Force Human Resources Laboratory, July 1970. (AD-713 638)

Vitola, B. M. & Valentine, L. D., Jr. Assessment of Air Force accessions by draft-vulnerability category. AFHRL-TR-71-10. Lackland AFB, Tex: Personnel Research Division, Air Force Human Resources Laboratory, March 1971. (AD-724 094)

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER AFHRL-TR-73-42	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE *(and Subtitle)* FACTORS RELATED TO ADAPTABILITY TO MILITARY SERVICE AMONG 1965 AIRMAN ACCESSIONS		5. TYPE OF REPORT & PERIOD COVERED 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Nancy Guinn		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS Personnel Research Division Air Force Human Resources Laboratory Lackland Air Force Base, Texas 78236		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 77190205
11. CONTROLLING OFFICE NAME AND ADDRESS HQ, Air Force Human Resources Laboratory Brooks Air Force Base, Texas 78235		12. REPORT DATE September 1973 13. NUMBER OF PAGES 18
14. MONITORING AGENCY NAME & ADDRESS*(if different from Controlling Office)*		15. SECURITY CLASS. *(of this report)* Unclassified 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT *(of this Report)* Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20, if different from Report)*		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)* adaptability unsuitability age educational level Category IV		
20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)* Distributions were accomplished to demonstrate the relationships between age, educational level, and AFQT scores of the 1965 airman accessions and their reenlistment desirability at the completion of their initial tour. The largest percentage of undesirable enlistees was found in the high school non-graduate, Category IV, and 17 year old groups. Using these three categories of variables, it was found that it would be possible to eliminate 34 percent of the undesirables, although 76 percent of the individuals falling in this three category group actually proved to be successful in their military career. It was emphasized that caution should be used in attempting to establish a screening procedure to identify undesirable enlistees since a significant number of potentially qualified personnel might be excluded at the same time.		

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*